Space Weather Forecast

Issued on Saturday, 28 January 2023 at 00:34 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of R1/R2 Radio Blackouts. Slight chance of G1/Minor Storm Days 1, 2 and 4 (28, 29 and 31 Jan)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours with the largest flare emanating from an emerging region of magnetic complexity near the southeast limb. This leaves eight other sunspot regions on the visible disc. However, all regions are small, weak, magnetically simple and mostly stable. Some minor growth has been seen near centre disc, but these regions remain fairly simple at this time.
No Earth-directed Coronal Mass Ejections (CMEs) were detected in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been at elevated levels over the last 24 hours, under the influence of a coronal hole fast wind. Wind speeds varied between 500-580 km/s. The total Interplanetary Magnetic Field was mostly weak, but reached moderate levels between 27/0400-0930 UTC. The north-south component fluctuated weakly. Geomagnetic Activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be predominantly Low, with a slight chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected during this period. Earth is under the influence of a coronal hole fast wind. Wind speeds are most likely to remain elevated through Day 1 (28 Jan), then show a slow decline in the coming days, perhaps to background levels by Days 3-4 (30-31 Jan). Further fast wind influence may start to give an increase in wind speeds later on Day 4, but it is more likely to occur after the end of this four day period.
Geomagnetic activity is expected to be Quiet to Unsettled (Kp 1-3), with a declining chance of isolated Active (Kp 4) intervals and just a slight chance of G1/Minor Storms (Kp 5) through Days 1 and 2, perhaps again later on Day 4 if we do see further fast wind influence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently expected to remain at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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